

Chapter 6 . Wetlands Assessment

6.1 Development of Wetland Water Quality Standards

In New Jersey the chemical, physical, and biological integrity of wetlands are protected under both federal and state laws. Federal protection is provided under sections 303, 401, and 404 of the Federal Clean Water Act. Section 401 is designed to allow the State to control any discharges to its waters, which may result from the issuance of a federal permit or license, through a certification process. Section 404 addresses and regulates the discharge of dredge and/or fill material into wetlands and other waters of the state. In 1994, New Jersey began implementing its State program in place of the Section 404 program after being granted the authority by the EPA pursuant to Section 404(g). Section 303 provides protection through the antidegradation provisions of the Surface Water Quality Standards. The State includes wetlands in the definition of "surface waters". Like many States, New Jersey is anticipating guidance from USEPA to develop wetlands criteria and guidance for incorporation into State rules and regulations.

Several New Jersey statutes provide various levels of protection to wetlands including the New Jersey Water Quality Planning Act (N.J.S.A. 58:11A-1), the Flood Hazard Area Control Act (N.J.S.A. 58:16A-50 et seq.) and the New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-1). Specific protection is provided for New Jersey tidal wetlands through the Wetlands Act of 1970. In addition, since July 1, 1988, the State has protected its "inland" wetlands through the Freshwater Wetlands Protection Act (FWPA) (N.J.S.A. 13:9B-1 et seq.). Prior to enactment of the FWPA, several different state laws afforded various levels of protection to "inland" wetlands. One of the goals of the Act was to consolidate the protection of wetlands into one program. It should be noted, however, that the FWPA does not affect wetlands previously regulated under the Wetlands Act of 1970. In addition, the FWPA exempted areas under the jurisdiction of the Hackensack Meadowlands Development Commission and therefore, activities in this area do not require a State freshwater wetlands permit nor are they subject to transition area requirements. In the areas under the regulation of the Pinelands Commission, freshwater wetland requirements are implemented, but applicants must also comply with the Pinelands Comprehensive Management Plan.

6.2 Integrity of Wetland Resources

Currently, NJDEP is in the midst of several research studies to monitor the biological, physical and chemical integrity of wetlands. Brief descriptions of these projects are provided below. Although all of these research projects are collaborative efforts, they are organized according to NJDEP Lead Program.

NJDEP Office of Natural Lands Management (ONLM) Wetlands Research

GAP Analysis. The NJDEP Office of Natural Lands Management (ONLM) classifies, maps and assesses the status of natural communities (both wetland and upland) of the state. This work is proceeding on a broad scale through multi-agency funding for the **Mid-Atlantic Gap Analysis Project**. Through this project, all of the vegetation of the state is being classified to the U.S. National Vegetation Classification, and mapping is being done at a scale of 1:100,000. This work is facilitating the development of conservation status ranks of vegetation communities and the

identification of communities that are imperiled or rare and of conservation concern at the state or global level.

ONLM Wetlands of Concern Research. Funded by the EPA wetland protection development grant program (Section 104.B.3), NJDEP Office of Natural Lands Management has initiated several projects aimed at developing monitoring programs for wetlands that are of conservation concern. These competitive grants have funded work to classify wetland vegetation communities, evaluate wetland quality for biodiversity conservation, and establish baseline monitoring for several wetland types including calcareous sinkhole ponds, pitch pine lowlands, pine barren riverside savannas, and non-tidal floodplain forests. These particular wetland types each harbor significant numbers of species that are endangered, threatened or rare in the state. This work will continue to focus on additional significant wetlands types as funding allows.

- For ***pitch pine lowland forest wetland communities***, in addition to classifying the vegetation of the different variations of the community, the fire history regime is being characterized to increase our understanding of the role of fire in maintaining the vegetation of the community types.
- For ***calcareous sinkhole pond communities***, in addition to classifying vegetation, much work has been done to characterize the relative contribution of groundwater vs. overland runoff to the wetlands, monitoring water dynamics over the course of a year. Benthic macroinvertebrates have been sampled, providing a glimpse of how these ephemeral palustrine communities differ from the riparian benthic communities that are regularly surveyed in the state.
- For ***pine barren riverside savanna communities***, in addition to classifying present day vegetation, sediment and peat cores have been analyzed to characterize the setting of the communities in the landscape as well as vegetation history (pollen) and fire history (charcoal). Groundwater monitoring wells have also been installed in several reference wetlands. What has emerged is a view of wetland communities that have been shaped and influenced by stream valley dynamics, groundwater flow, stream flooding, and fire over the past 8000 – 9000 years.
- For ***non-tidal floodplain forest wetlands***, work has begun on vegetation classification and identification of reference wetland sites. Once reference sites are selected, additional environmental data including existing surface water monitoring data from adjacent streams will be reviewed to characterize the environmental setting of the reference sites and to develop monitoring plans for one high quality and one degraded floodplain forest per watershed management area.

New Jersey Rare Wetlands Plant Species Trends. Through funding from NJDEP's Division of Science, Research and Technology, the Office of Natural Lands Management has also been reviewing the Natural Heritage Database to assess trends and develop monitoring plans for Endangered Plant Species. More than 50% of the endangered plant species in New Jersey use

wetland habitats and this work can be partitioned to focus on the wetland species, thereby providing an assessment of an important natural resource of our wetlands.

NJDEP Land Use Regulation Program Research

Hydrogeomorphic Assessment (HGM). NJDEP and Rutgers University scientists are conducting an EPA-funded study to assess the feasibility of using Hydrogeomorphic Wetlands Assessment methods in New Jersey. Thirteen reference wetland sites are being field studied in-depth to develop an HGM model for riverine wetlands in New Jersey's glacial lake basin.

NJDEP Division of Science, Research and Technology Research

Developing Indicators of Wetland Quantity and Quality. NJDEP scientists within both the Division of Science, Research and Technology and the Land Use Regulation Program are working with NJDEP consultants to field assess wetland mitigation sites in New Jersey. The research goals of this State-supported project include indicators of mitigation acreage achieved (quantity), as well as potential wetlands quality indicators through a Qualitative Rapid Assessment Tool that is predictive in nature.

Regional Geographic Initiative: Development of Wetlands Quality and Function Assessment Tools and Demonstration in Two New Jersey Watersheds. Rutgers University scientists working on the HGM project (cited previously) have teamed with the Division of Science, Research and Technology and Land Use Regulation Program to conduct a comprehensive literature review of wetland functional assessment tools and apply a subset of the most promising tools at the HGM reference wetlands. The results of this EPA-supported work will help NJ understand the utility of various functional assessment tools for some New Jersey wetlands.

Testing a Wetlands Mitigation Rapid Assessment Tool At Mitigation and Reference Wetlands in New Jersey. The Rapid Assessment Tool under development through the *Wetlands Quantity and Quality Indicator* project cited previously will be field-tested at the HGM reference wetlands sites by Rutgers University scientists. This State-supported research will tie the various functional assessment studies together by comparing the application of these different tools at the same sites. The research will also provide a comparison between naturally occurring wetlands sites and mitigation sites. Finally, this work will provide additional data about the consistency in application of a rapid assessment tool by different evaluators.

Wetlands Metal Sequestration and Citizen Knowledge. Scientists from NJDEP, Princeton University, and the Stony Brook-Millstone Watershed Association are conducting an EPA-NSF funded study to link an ecological model of metal behavior in wetland soils, as affected by plant species composition, with a sociological study of citizen perceptions of the function and value of wetlands. This study will explore how such perceptions may change with the benefit of information from the wetlands metals research.

Endangered and Nongame Species Program (ENSP) Research

Landscape Project. NJDEP's Endangered and Nongame Species Program (ENSP) in collaboration with multiple partners, has developed a landscape level approach to protect rare

species and critical wildlife habitat. Priority habitats for rare species by NJ Landscape Region for wetlands, forest, and grassland species are being mapped using an extensive data base of species locations, land use classification data, and scientific literature values on species ranges. Internet-based and hardcopy mapping products will be provided at the state, county and municipal levels to provide users with information for planning and regulatory applications.

Herpetofauna Projects. NJDEP's ENSP has three citizen-science based herpetofauna conservation projects to identify wetlands-associated species. Herpetofauna serve as surrogates for water quality. Through peer-review journal publications, it is quite clear that most amphibians and some reptiles are excellent bio-indicators for water quality.

- The *New Jersey Herptile Atlas*, which began in 1994, is a ten-year project aimed at determining amphibian and reptile distribution and population statewide through volunteer surveys. The Atlas is in the process of collecting point location data for all species.
- The *Calling Amphibian Monitoring Program* works with volunteers to survey 24 transects statewide in order to perform frog and toad population trend analysis. All survey points are geo-referenced.
- The *Vernal Pool Protection Project*, anticipated to begin September 2000, will have volunteers confirm locations of vernal ponds and survey these locations for herpetofauna.

See www.dep.state.nj.us/dep/fgw/ensphome.htm for more information on these ENSP initiatives.

6.3 Extent of Wetland Resources

Since 1995, NJDEP has participated in the National Environmental Performance Partnership System (NEPPS) to institute Results-Based Management Department-wide. Measures of environmental progress, using the stressor-condition-response model of indicators are a key aspect of the NEPPS process. NJDEP's 1998 Strategic Plan set forth a milestone for wetlands:

Milestone: By 2005, there will be a net increase in wetland acreage and quality.

Following the stressor-condition-response model of environmental indicators, NJDEP has developed stressor and condition indicators for wetlands in New Jersey. These measures, identified by stakeholders as important measures of wetland stressors and conditions, are beginning to provide a consistent set of status and trend data for NJ wetlands. Although NJDEP has not yet developed the response indicator data in time for the 305B report, NJDEP expects to include response indicators (such as number of acres of wetlands preserved), as the third component to the stressor-condition-response indicators for wetlands.

Stressor Indicator: NJDEP Permitted Wetlands Losses

Permitted wetlands disturbances in relation to wetland mitigation required is an indirect measure of the net change in impacted wetlands acreage in New Jersey. From July 1, 1988 to June 30, 1999, 1,638.12 acres of NJ freshwater wetlands were permitted to be disturbed, while a total of

920.12 acres of compensatory mitigation were required, resulting in an estimated permitted net loss of 718 acres of freshwater wetlands over this eleven-year period. Assuming the 1986 freshwater wetland baseline of 739,160 acres (NJDEP Bureau of Geographic Information and Analysis), the permit data indicate approximately 0.22% of NJ freshwater wetlands have been permitted for disturbance resulting in a permit-estimated net loss of 0.09% of freshwater wetlands over this eleven year period.

From 1992 to 1998, an estimated 204.18 acres of NJ coastal wetlands were permitted to be disturbed. Required mitigation for this disturbance consisted of approximately 17.5 acres of creation and 8,849 acres of enhancement (return of natural tidal flow to former salt hay farms). While there has been a net loss of coastal wetlands, there is projected to be an increase in the function and value of approximately 8,900 acres of coastal wetlands where enhancement and restoration projects are underway.

Data on the impacts to wetlands as a result of exemptions specified in the New Jersey Freshwater Wetlands Protection Act are not included in these data. Regulatory authority for wetlands permits within the Hackensack Meadowlands is under the jurisdiction of the U.S. Army Corps of Engineers and therefore, data for permitted wetlands activities within the Hackensack Meadowlands are not accounted for. While New Jersey does retain authority for wetlands impacts under Section 401 of the Clean Water Act, in practice NJDEP defers to the HMDC and their consistency finding with New Jersey's Coastal Zone Management Plan. NJDEP will work with HMDC to include these data in the next iteration of indicator reporting. Other exemptions not reported include: ongoing farming activities such as construction or maintenance of farm ponds or irrigation ditches and maintenance of farm or forest roads; projects for which preliminary site plan or subdivision applications received preliminary approvals prior to the effective date of the Act (7/1/88); projects for which preliminary site plan or subdivision applications were submitted prior to June 8, 1987 (at which time Governor Kean issued a moratorium on construction in wetlands until FWWPA signed); and permit applications that were approved by the Army Corps of Engineers prior to the effective date of the Act.

See Chapter 6 Appendix for more complete information on this stressor indicator.

Condition Indicator: Acres of Freshwater and Tidal Wetlands in New Jersey.

NJDEP maintains a digital data set of land use/land cover data using a modified Anderson (Anderson et al. 1976) classification system based upon 1:24,000 and 1:12,000 scale aerial photography from two points in time: 1986 and 1995/97. The minimum mapping unit for wetlands is 1 acre. Thousands of ground-truth points are associated with these data sets. The 1995/97 data set also includes an impervious surface cover data layer at 5% imperviousness intervals.

Freshwater wetlands were delineated at 1:12,000 in both 1986 and 1995/97 to a one-acre minimum mapping unit. Coastal wetlands were delineated at 1:24,000 in 1986 and 1:12,000 in 1995/97. Data for 1986 are currently available on the Internet for all of New Jersey. Statewide data for 1995/97 are expected in Fall 2000; however, NJDEP is releasing data on a watershed

management area basis in DRAFT form as they become available. Once all data are received, quality-assured, and edge-matched, NJDEP will release a FINAL statewide coverage. See www.state.nj.us/dep/gis for the 1986 and 1995/97 NJDEP land use/land cover data and complete metadata.

Since NJDEP's land use/land cover data are more precise than previously available data sets, NJDEP is reporting on statewide wetlands acres based on the 1986 coverage. NJDEP is also reporting on net loss of wetlands acres by Anderson classification system for 12 out of 20 NJ Watershed Management Areas between the period 1986-1995/97. NJDEP will be able to provide statewide net loss acreages for the entire State after all 1995/97 data are received (expected Fall 2000). NJDEP is also expecting to update these data into the future to track land use/land cover change over time.

Based upon the 1986 Land Use/Land Cover data set, NJDEP estimates there are 948,429 acres of wetlands in New Jersey broken out as: 739,160 acres of freshwater wetlands and 209,269 acres of tidal wetlands. NJDEP estimates that wetlands comprise approximately 19% of the total NJ land base of 4,984,338 acres.

1986 New Jersey Wetlands (Freshwater and Tidal) By County

County	Land Area (sq. miles)	Wetland Area based on 1986 LULC (Acres)	% of County is Wetlands based on 1986 LULC
Atlantic	569	120974	33.2%
Bergen	234	11891	7.9%
Burlington	819	137193	26.2%
Camden	221	19941	14.1%
Cape May	267	81511	47.7%
Cumberland	500	93956	29.4%
Essex	130	6493	7.8%
Gloucester	329	32219	15.3%
Hudson	47	2792	9.3%
Hunterdon	423	19918	7.4%
Mercer	228	20925	14.3%
Middlesex	312	39994	20.0%
Monmouth	476	63546	20.9%
Morris	468	43148	14.4%
Ocean	642	100799	24.5%
Passaic	192	9020	7.3%
Salem	365	56638	24.2%
Somerset	307	24939	12.7%

County	Land Area (sq. miles)	Wetland Area based on 1986 LULC (Acres)	% of County is Wetlands based on 1986 LULC
Sussex	527	41585	12.3%
Union	103	3342	5.1%
Warren	362	17605	7.6%
Total	7521	948429	19.7%

Draft Wetlands Change By Anderson Type, 1986-1995 For 12 Of 20 NJ Watershed Management Areas					
Anderson Label	Anderson Code	Acres 1986	Acres 1995	Acreage Loss/Gain	Percent Change
Agricultural Wetlands (Modified)	2140	38142	33430	-4711	-12.4%
Atlantic White Cedar Swamp	6221	11175	10878	-297	-2.7%
Coniferous Scrub/Shrub Wetlands	6232	3230	3183	-47	-1.5%
Coniferous Wooded Wetlands	6220	17949	17450	-499	-2.8%
Deciduous Scrub/Shrub Wetlands	6231	30442	27376	-3067	-10.1%
Deciduous Wooded Wetlands	6210	193813	186821	-6993	-3.6%
Disturbed Wetlands (Modified)	7430	5966	9707	3741	62.7%
Former Agricultural Wetland-Becoming Shrubby, Not Built-Up)	2150	2	3170	3168	195571.3%
Freshwater Tidal Marshes	6120	1368	1339	-29	-2.1%
Herbaceous Wetlands	6240	28120	25035	-3085	-11.0%
Managed Wetland In Built-Up Maintained Rec Area	1850	1807	2309	502	27.8%
Managed Wetland In Maintained Lawn Greenspace	1750	3218	3981	763	23.7%
Managed Wetlands (Modified)	8000	442	0	-442	-100.0%
Mixed Brush And Bog Wetlands, Coniferous Dominate	6234	3140	3266	126	4.0%
Mixed Forested Wetlands (Coniferous Dom.)	6252	19965	19529	-436	-2.2%
Mixed Forested Wetlands (Deciduous Dom.)	6251	24461	23927	-534	-2.2%
Mixed Scrub/Shrub Wetlands (Deciduous Dom.)	6233	3952	3930	-23	-0.6%
Saline Marshes	6110	32520	32341	-179	-0.6%
Vegetated Dune Communities	6130	1909	2054	145	7.6%
Wetland Rights-Of-Way (Modified)	1461	2420	2460	39	1.6%
Severe Burned Wetlands	6500	0	429	429	100.0%
Total		424042	412612	-11430	-2.7%

6.4 Additional Wetlands Protection Activities

Preservation

The State of New Jersey has a long history of preservation of open space, including important wetlands habitat. NJDEP implements land preservation through its Green Acres Program.

The preservation of wetlands as a natural resource is a policy of the Green Acres Program. The program is predicated on the preservation of open space for public conservation and recreation purposes. These purposes include both freshwater and coastal wetlands and wetland systems such as stream corridors, aquifer recharge areas and floodplains. Green Acres has provided funding for direct acquisition by the State of wetlands along the Delaware Bayshore, in the Highlands and Pinelands regions of New Jersey. The local government and nonprofit funding programs also provide funding for wetlands preservation.

The Green Acres project ranking system considers wetlands features as an element of the natural resources of the proposed project. The water quality protection element of wetlands along with the protection of headwaters and stream corridors is an important feature of Green Acres acquisition projects.

In addition to acquisition programs, Green Acres also has a tax exemption program for nonprofit conservation organizations. This program provides for property tax exemption for lands owned by nonprofits that have conservation and recreation value and provide for public access and use. Many freshwater wetland systems, such as Troy Meadows are enrolled in the program.

In 1998, New Jersey voters approved a constitutional dedication of \$98 million of annual funds for ten years and over \$1 billion in bond financing to support open space preservation. Passage of the Garden State Preservation Trust Act in June 1999, established this stable source of funding. For more information see: www.state.nj.us/dep/greenacres/challenge.htm

Mitigation

NJDEP requires compensatory mitigation for activities in wetlands that involve investigation, cleanup, or removal of hazardous materials, as well as activities requiring Individual Permits (activities that exceed the requirements of General Permits). Mitigation of wetlands can be achieved through wetland creation, restoration and/or wetland enhancement. NJDEP is establishing performance standards for various types of wetland mitigation to inform applicants of success criteria they need to meet.

Other forms of mitigation include: upland preservation to benefit a freshwater wetland ecosystem; purchase of mitigation credits from a wetland banker who has performed wetland creation, restoration, and/or enhancement; or monetary contribution to the Wetland Mitigation Fund for wetland creation or land donation by the Freshwater Wetland Mitigation Council.

The Freshwater Wetlands Mitigation Council has awarded over \$600,000 from the Wetland Mitigation Fund towards the enhancement, restoration and creation of wetlands throughout New Jersey.

NJDEP's Office of Natural Resource Damages has facilitated wetlands enhancement, creation, restoration and preservation efforts near natural resource damage sites.

The US Fish & Wildlife Service has been working with landowners to restore 482 acre of salt marsh to benefit waterfowl in New Jersey. This program has also helped revegetate three miles of riparian corridors. Also, the Army Corps of Engineers is working on plans to help restore the stream banks of the Cooper River in Camden County.

Conservation Resource Enhancement Program

The Conservation Resource Enhancement Program is a joint federal and state land conservation program designed to address state and nationally-significant water quality, soil erosion, and wildlife habitat issues related to agricultural land use. NJDEP and the NJ Department of Agriculture are anticipating a cooperative program with the federal government to purchase easements or rental contracts on up to 30,000 acres of riparian buffers on agricultural lands. These lands are expected to include wetlands and implementation of the program is expected to contribute to NJ's goal of achieving a net gain in wetlands acreage and quality.

Proposed Rules

NJDEP has recently issued Proposed readoption of freshwater wetlands rules to help achieve wetlands goals for increased wetland acreage and quality by 2005. Included in the proposal are vernal pool protection and additional buffers adjacent to wetland transitional areas for residential development. In addition, NJDEP is proposing that mitigation not only occur within the same watershed so that it is as close to the site of impact as feasible, but also hoping to foster consolidation of smaller mitigation projects into one larger site to increase wetland acreage, function, and value. For more information on the proposed rules: www.state.nj.us/dep/landuse.

NJDEP has recently issued Proposed Water Quality and Watershed Management Rules to enable water quality management planning efforts on a watershed basis. These proposed rules, if adopted, will provide increased protection of wetlands as environmentally sensitive areas; through stormwater nonpoint source requirements; and through maintenance of baseflow in streams. For more information see www.state.nj.us/dep/watershedmgt.